

PAT-NO: JP02002129250A
DOCUMENT-IDENTIFIER: JP 2002129250 A
TITLE: METHOD FOR PRODUCING METALLIC TITANIUM
PUBN-DATE: May 9, 2002

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APPL-NO: JP2000330095

APPL-DATE: October 30, 2000

INT-CL (IPC): C22B034/12 , C22B005/02 ,
C22B009/10 , C22B009/20 ,
C25C003/02 , C25C003/22

ABSTRACT:

PROBLEM TO BE SOLVED: To produce metallic titanium from titanium oxide by a continuous and circulating type process.

SOLUTION: A first stage in which titanium oxide powder is mixed with a (Ca+ CaCl₂) mixed phase reducing agent, this mixture is forged at 900 to

1,000°C to produce titanium particles, and simultaneously, a mixed by-product of calcium chloride and calcium oxide is obtained, a secondary stage in which the reduced by-product recovered in the first stage is charged into water in which gaseous chlorine has been blown, and stirring is performed to separate the titanium particles in the aqueous solution, a third stage in which the powdery titanium recovered in the second stage is cleaned and dried and is thereafter compacted and sintered into an electrode bar, and, after that, by arc melting, a titanium ingot is obtained, a fourth stage in which the aqueous solution freed of the titanium particles in the second stage is evaporated and dried to harden and the obtained product is thereafter heated to ≥800°C to obtain molten calcium chloride and a fifth stage in which the molten calcium chloride recovered in the fourth stage is electrolyzed at 850 to 950°C and is separated into a molten (Ca+CaCl₂) mixed phase and gaseous chlorine, and the former is used as a reducing agent in the first stage, and, on the other hand, the latter as gaseous chlorine in the second stage respectively in a circulating way, are combined.

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